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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/522,576

01/28/2005

Moonish R Patel

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EXAMINER

DINH, TIEN QUANG

ART UNIT

PAPER NUMBER

3644

MAIL DATE

DELIVERY MODE

10/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/522,576

Applicant(s)

PATEL ET AL.

Examiner

Tien Dinh

Art Unit

3644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 12-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-6, 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hosick et al.

Hosick et al teaches a system that provides attitude control. The system has control logic/modules to control the reaction wheel 40 assemblies and gimbaled thruster assemblies 22 during orbit transfers or any other maneuvers as desired that can result in minimal gimbal stepping. The system has processors and software. The maneuver control module has a momentum adjust module and a gimbal module that constantly take into account the operations of the reaction wheel and the thrusters and use first, second, and third output signals to control the spacecrafts. When there is a torque deficit, the system as a whole adjust the reaction wheels and the thrusters so that the correct maneuvering commands are sent to the wheels and the thrusters. See column 7, lines 1-52. See column 9, lines 29-45. See column 10, lines 6-21. See column 11, lines 9-23.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3644

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita 6622969 in view of Goodzeit 6481672.

Yamashita discloses a system having control logic/control module (that is part of the parts 8, 6, 9, 4, 5) to control reaction wheel assemblies 7 and control logic/control module to control the thrusters 10 are well known. The system can operate during orbit transfers. The use of reaction wheels and thrusters results in minimal gimbal stepping since they work together. Yamashita is silent on the gimballed thrusters. However, Goodzeit discloses a system having control logic to control gimballed thrusters are well known. See abstract.

It would have been obvious one skilled in the art at the time the invention was made to have used control logic to control gimballed thrusters in Yamashita's system as taught by Goodzeit to allow great maneuverability to the spacecraft.

Re claims 5 and 10, parts 8, 6, 9, 4, 5 have processors and hence software etc.

Re claim 11, the maneuver control module, which is comprised of parts 8, 9, 4, 5, 6, are used to control the maneuvers of the spacecraft. The maneuver control module has a momentum adjust module which control the thruster 10 and reaction wheel 7. The second output is the thruster momentum adjust torque and a third output relating to the integral momentum adjust torque, which is the summation of the thruster output and reaction wheel before it is "pointed" to the satellite dynamics 1. When there is a torque deficit, the gimbal module is sent back to the main control module via elements 16, 19. The reaction wheel control module would then

Art Unit: 3644

generates the signal to the momentum wheel assemblies to adjust the maneuvers of the spacecraft as desired in part of the reiterations.

Claims 2, 3, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita 6622969 as modified by Goodzeit 6481672 as applied to claims 1 and 6 above, and further in view of Baldwin et al 6870164.

Yamashita 6622969 as modified by Goodzeit 6481672 discloses all claimed parts except for the Hall Current Thrusters. However, Baldwin et al discloses that Hall Current Thrusters are well known in the art.

It would have been obvious to one skilled in the art at the time the invention was made to have used Hall Current Thrusters in Yamashita 6622969's system as modified by Goodzeit 6481672 and as taught by Baldwin et al as a substitution of parts to have a lighter thruster system.

Claims 2, 3, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosick et al 6032904 in view of Baldwin et al 6870164

Hosick et al discloses all claimed parts except for the Hall Current Thrusters. However, Baldwin et al discloses that Hall Current Thrusters are well known in the art.

It would have been obvious to one skilled in the art at the time the invention was made to have used Hall Current Thrusters in Hosick's system as taught by Baldwin et al as a substitution of parts to have a lighter thruster system.

Response to Arguments

The examiner maintains that the prior art still read upon what has been claimed. The amended independent claims do not limit the apparatus or structure claims. The “wherein” clause carries no patentable weight. The control logic/control module is capable of adjusting the reaction wheel assemblies based upon the torque deficit associated with the gimbaled thrusters. In addition, even if the “wherein” clause were given some weight, the claimed structure is clearly met in the cited prior arts. Plus, torque deficit are broad terms. If there is not enough torque being produced by the reaction wheels are capable of taking over some of the burden and produce the adjustment needed to allow the spacecraft to have the desired attitude. The reaction wheels and the thrusters work together to control the spacecraft so if one is not supplying enough torque, the other is capable of being used to compensate.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 3644

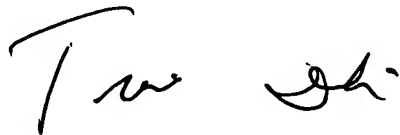
however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tien Dinh whose telephone number is 571-272-6899. The examiner can normally be reached on 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TD

A handwritten signature in black ink, appearing to read "Tien Dinh", is written over the typed name "Tien Dinh" in the signature line.